

Application No.: 09/974,582

Docket No.: JCLA7521

In The Claims:

Claim 1 (Currently amended) An etching process, comprising:~~A plasma etching gas suitable for etching a silicon layer in a silicon oxide etching device, the plasma etching gas comprising:~~

providing a substrate having a silicon layer thereon in a silicon oxide etching device; and
etching the silicon layer using an plasma etching gas, wherein the plasma etching gas
comprising:

a fluoro-alkane gas; and

a nitrogen gas.

Claim 2 (Currently amended) The plasma etching gas etching process of claim 1,
wherein a flow rate of the nitrogen is about 1 sccm to about 50 sccm.

Claim 3 (Currently amended) The plasma etching gas etching process of claim 1, wherein
the fluoro-alkane is selected from a group consisting of CF₄, C₂F₆, C₃F₈, C₄F₈, CH₃F, CHF₃ and
CH₂F₂.

Claim 4 (Currently amended) The plasma etching gas etching process of claim 1, wherein
the plasma etching gas further comprising an argon gas.

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Claim 5 (Currently amended) The plasma etching gas etching process of claim 4, wherein a flow rate of the argon gas is about 50 sccm to about 150 sccm.

Claim 6 (Currently amended) An etching process, comprising:~~A plasma etching gas suitable for etching a silicon layer in a silicon oxide etching device, the plasma etching gas comprising:~~

providing a substrate having a silicon layer thereon in a silicon oxide etching device; and
etching the silicon layer using an plasma etching gas, wherein the plasma etching gas
comprising:

a partially fluoro-substituted alkane gas;

a fully fluoro-substituted alkane gas; and

a nitrogen gas.

Claim 7 (Currently amended) The plasma etching gas etching process of claim 6, wherein a flow rate of the nitrogen is about 1 sccm to about 50 sccm.

Claim 8 (Currently amended) The plasma etching gas etching process of claim 6, wherein the fully fluoro-substituted alkane is selected from a group consisting of CF₄, C₂F₆, C₃F₈ and C₄F₈.

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Claim 9 (Currently amended) The ~~plasma etching gas etching process~~ of claim 1-6, wherein the partially fluoro-substituted alkane gas is selected from a group consisting of CH₃F, CHF₃ and CH₂F₂.

Claim 10 (Currently amended) The ~~plasma etching gas etching process~~ of claim 6, wherein the partially fluoro-substituted alkane gas is CHF₃, and the fully fluoro-substituted alkane gas is CF₄.

Claim 11 (Currently amended) The ~~plasma etching gas etching process~~ of claim 10, wherein a ratio of CHF₃ to CF₄ is about 3/1 to about 15/1.

Claim 12 (Currently amended) The ~~plasma etching gas etching process~~ of claim 10, wherein a flow rate of the nitrogen is about 1 sccm to about 50 sccm.

Claim 13 (Currently amended) The ~~plasma etching gas etching process~~ of claim 10, further comprising an argon gas.

Claim 14 (Currently amended) The ~~plasma etching gas etching process~~ of claim 13, wherein the flow rate of the argon gas is in the range of about 50 sccm to about 150 sccm.

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Claim 15 (Currently amended) The plasma etching gas etching process of claim 6 10, wherein a ratio of CHF₃ to CF₄ is about 3/1 to about 15/1.

Claim 16 (Currently amended) The plasma etching gas etching process of claim 6, further comprising an argon gas.

Claim 17 (Currently amended) The plasma etching gas etching process of claim 16, wherein flow rate of the argon gas is about 50 sccm to about 150 sccm.

Claim 18 (Currently amended) A method of producing a semiconductor device, comprising:
providing a silicon substrate having an oxide layer, a mask layer and a photoresist layer thereon, wherein the photoresist layer has an opening therein;
arranging the silicon substrate in a silicon oxide etching device; and
etching the mask layer, the oxide layer and the silicon substrate exposed by the opening
using an plasma etching gas, wherein the plasma etching gas comprising:
a fluoro-alkane gas; and
a nitrogen gas.
forming an oxide layer on the substrate;
providing an etching gas consisting of fluoro-alkane gas and nitrogen gas; and
etching the oxide layer by using the etching gas.

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Claim 19 (Original) The method of claim 18, wherein a flow rate of the nitrogen gas is about 1 sccm to about 50 sccm.

Claim 20 (Original) The method of claim 18, wherein the fluoro-alkane is selected from a group consisting of CF₄, C₂F₆, C₃F₈, C₄F₈, CH₃F, CHF₃ and CH₂F₂.

Claim 21 (Original) The method of claim 18, wherein the etching gas further comprises an argon gas.

Claim 22 (Original) The method of claim 21, wherein flow rate of the argon gas is about 50 sccm to about 150 sccm.